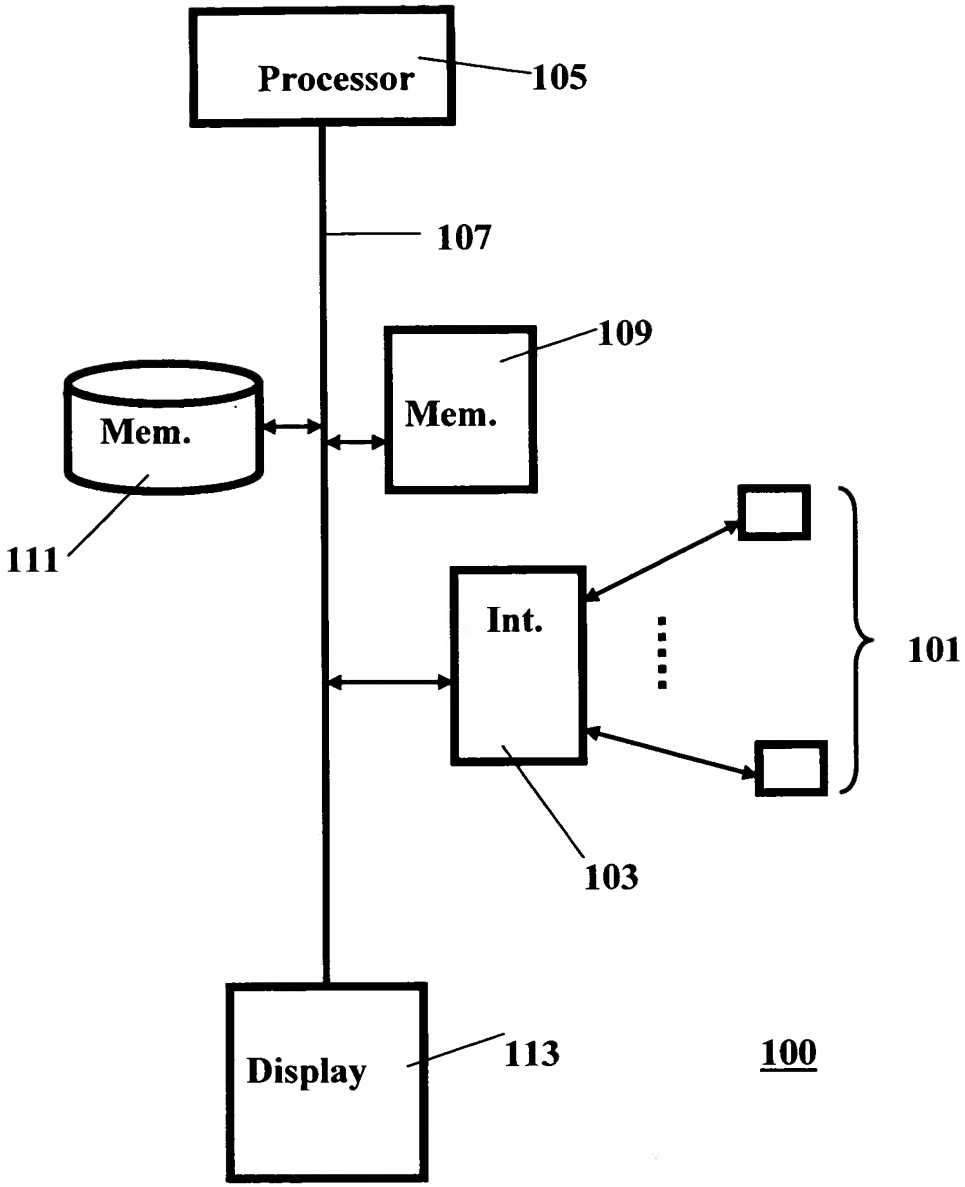

FIG. 1

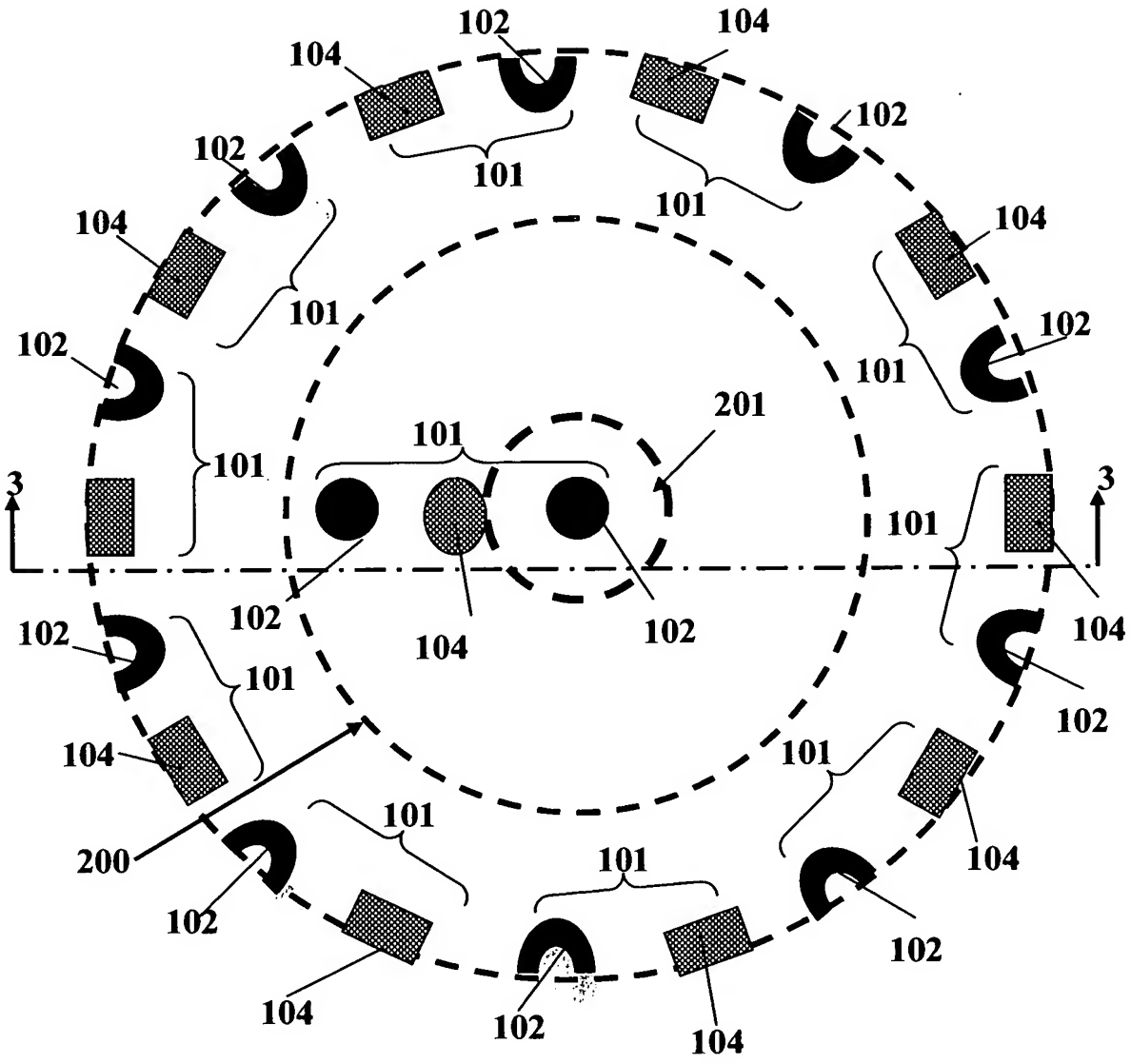
102
104
104
102
101
101
102
104
104
101
101
102
201
101
3
3
101
102
104
102
104
102
101
101
104
200
101
101
102
104
102
104
102

FIG. 2

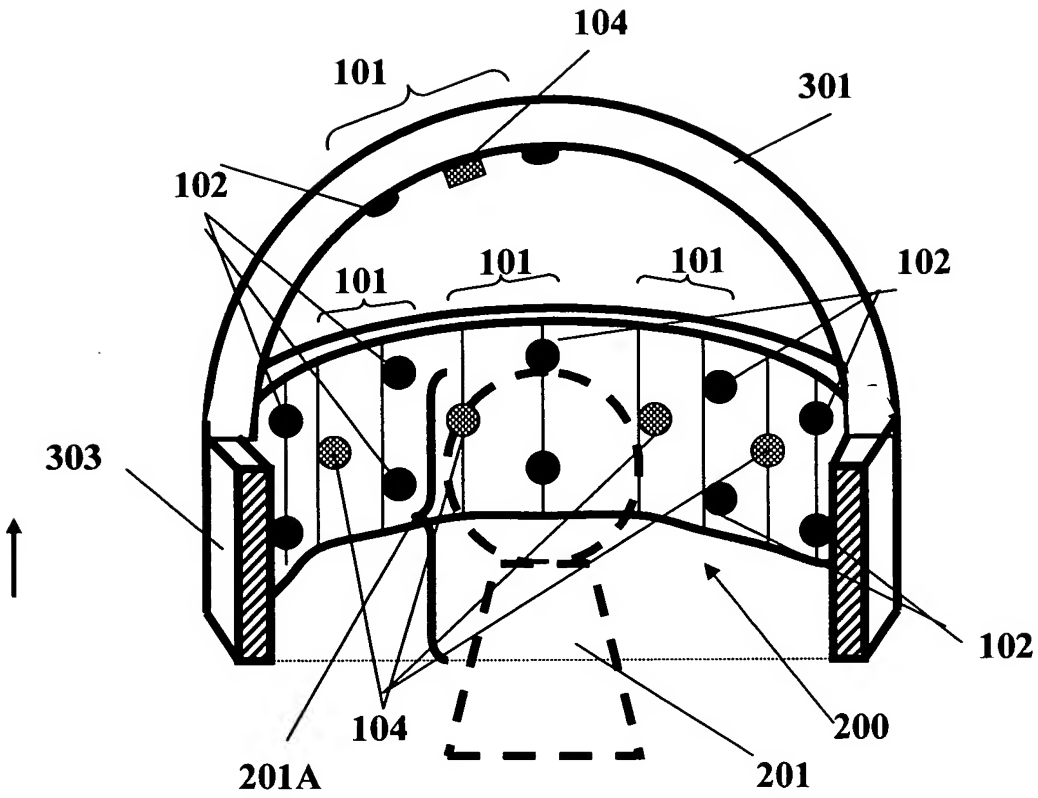

FIG. 3

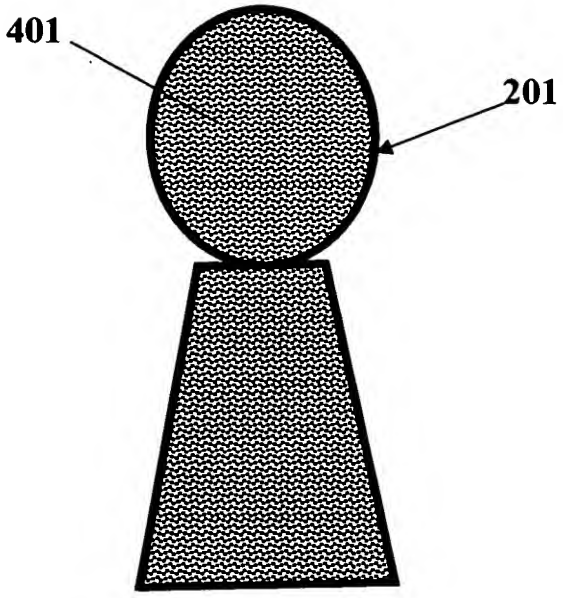

FIG. 4

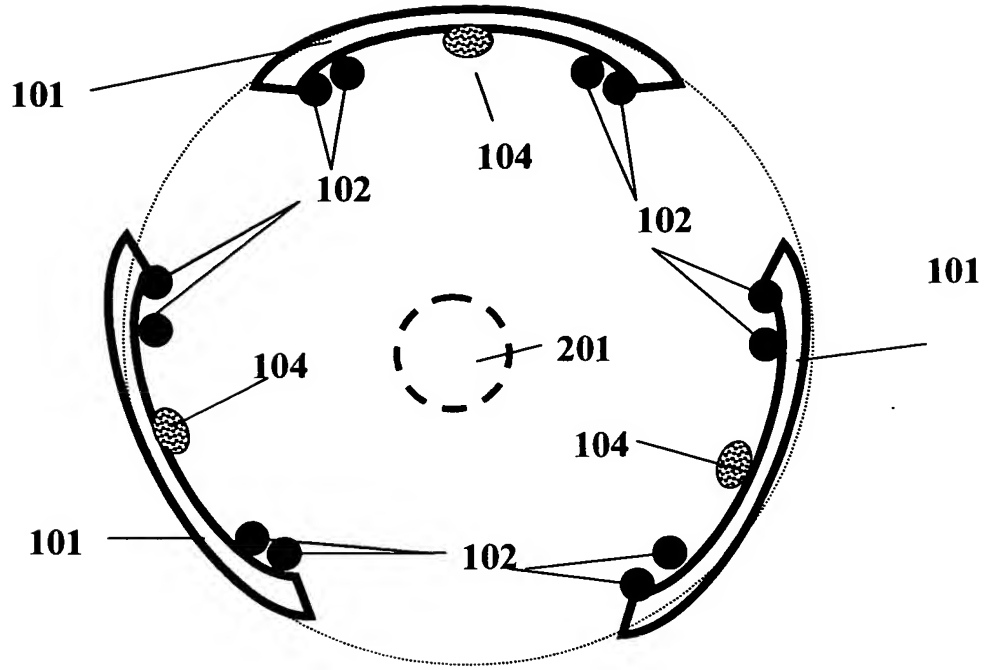

FIG. 5

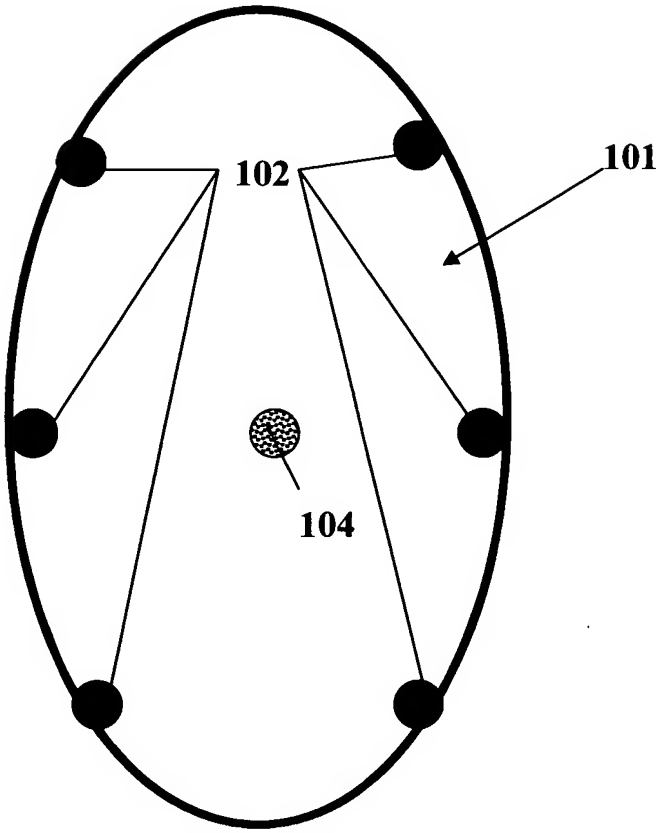

FIG. 6

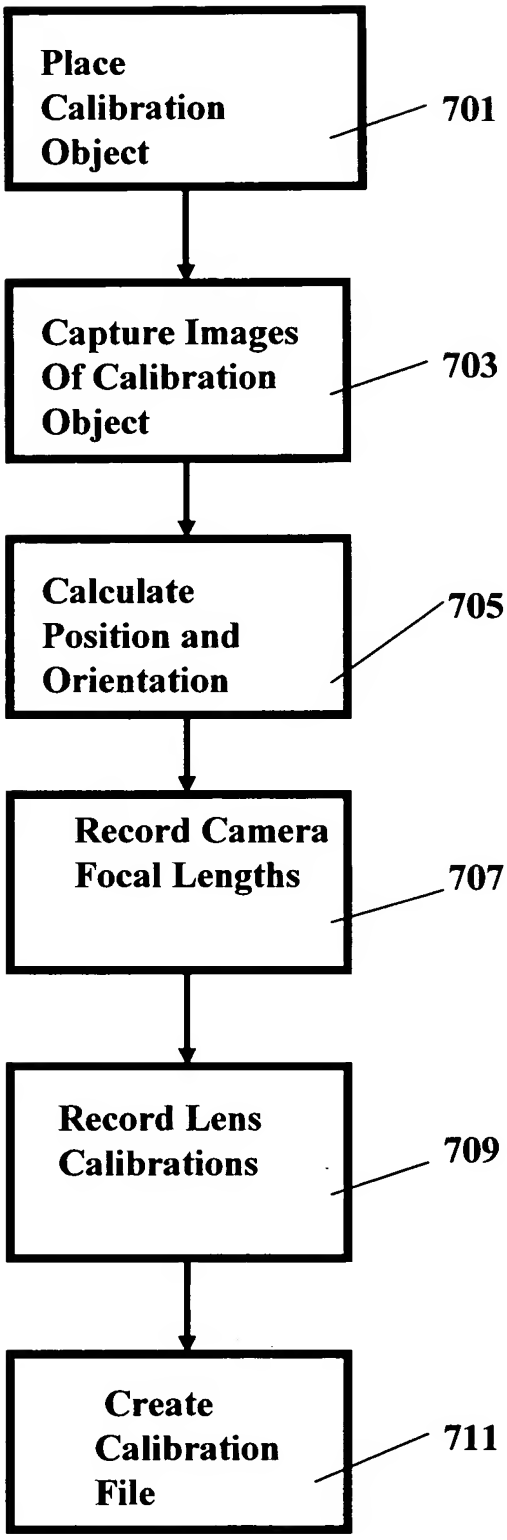
Place Calibration Object
701
Capture Images Of Calibration Object
703
Calculate Position and Orientation
705
Record Camera Focal Lengths
707
Record Lens Calibrations
709
Create Calibration File
711

FIG. 7

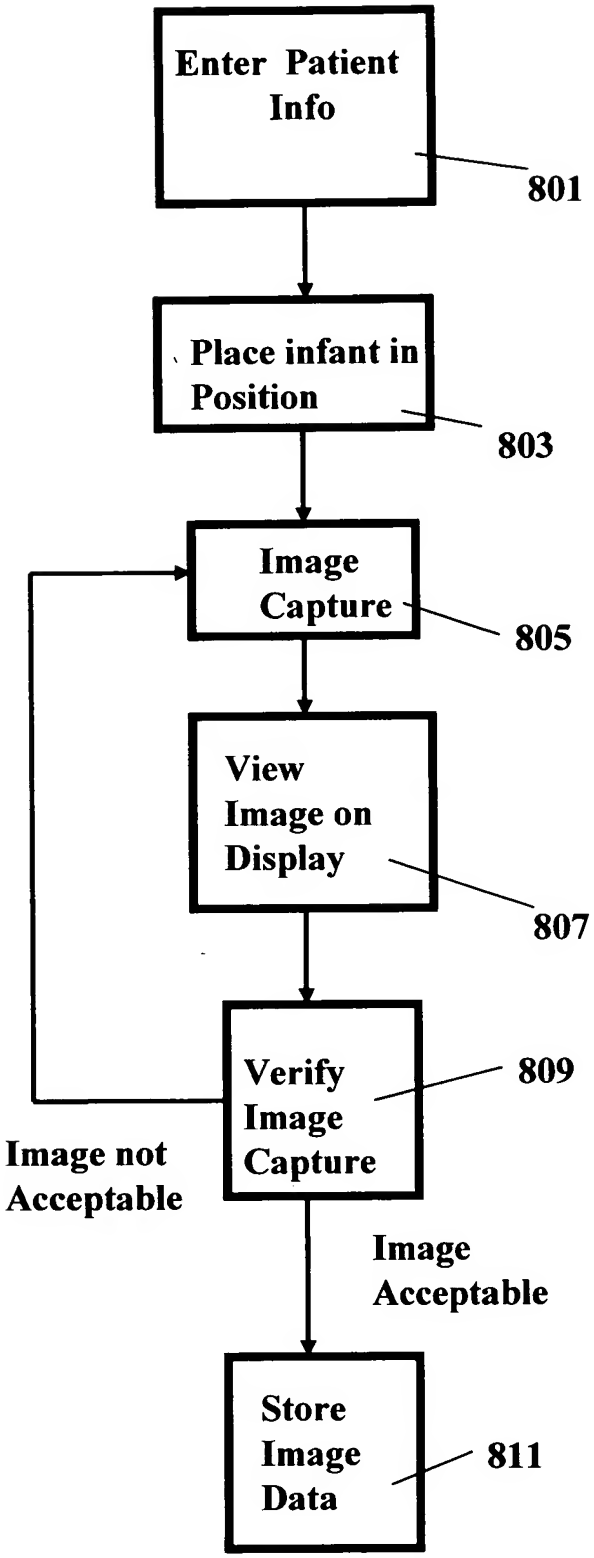
Enter Patient Info
801
Place infant in Position
803
Image Capture
805
View Image on Display
807
Verify Image Capture
809
Image not Acceptable
Image Acceptable
Store Image Data
811

FIG. 8

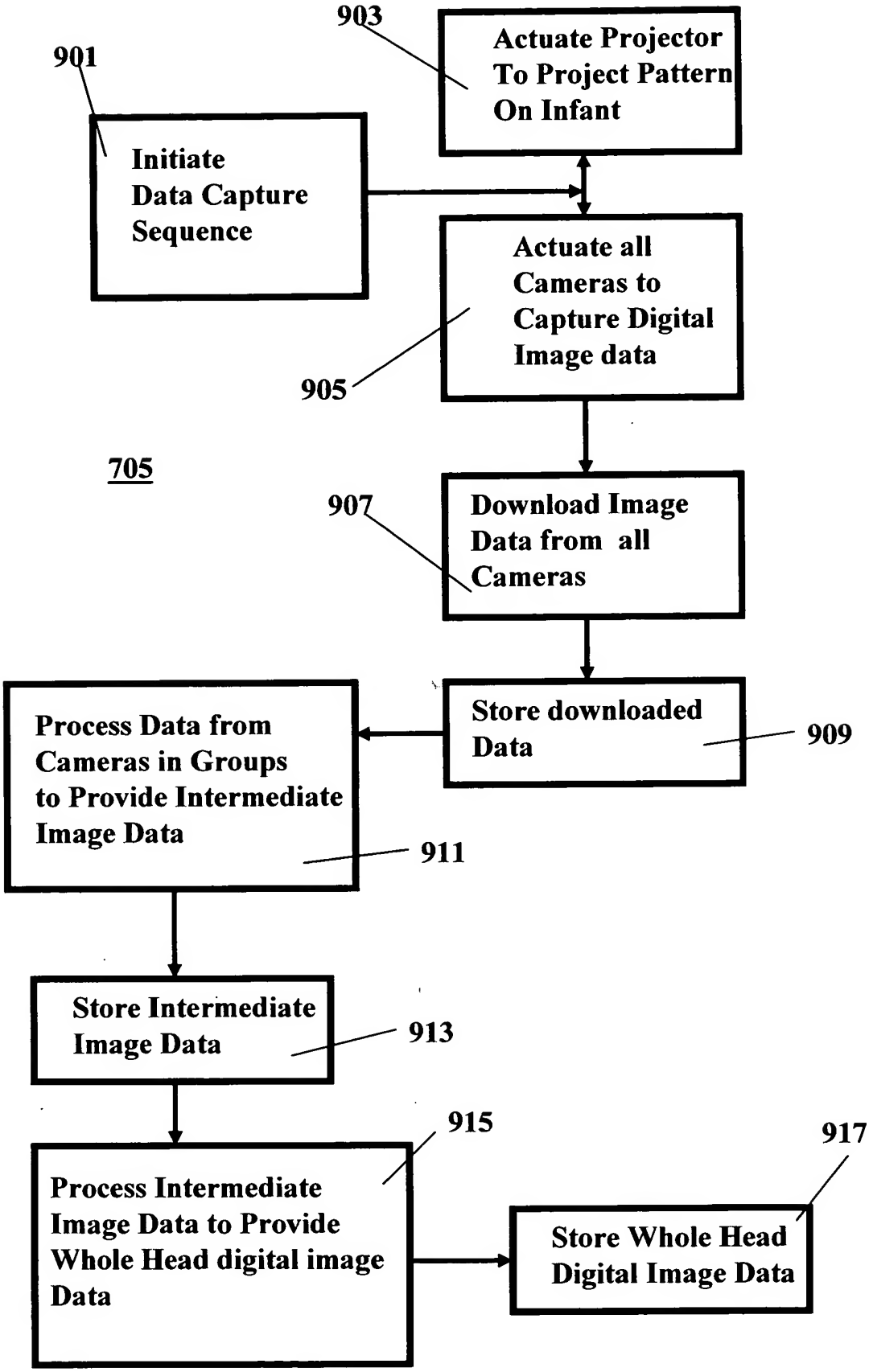
901
Initiate Data Capture Sequence
903
Actuate Projector To Project Pattern On Infant
905
Actuate all Cameras to Capture Digital Image data
705
907
Download Image Data from all Cameras
909
Store downloaded Data
911
Process Data from Cameras in Groups to Provide Intermediate Image Data
913
Store Intermediate Image Data
915
Process Intermediate Image Data to Provide Whole Head digital image Data
917
Store Whole Head Digital Image Data

FIG. 9

1001 PRODUCE CAST OF FIRST SHAPE

↓

1003 PRODUCE CAST OF SECOND CORRESPONDING SHAPE

↓

1005 DIGITALLY CAPTURE FIRST SHAPE

↓

1007 PRODUCE FIRST DIGITAL DATA

↓

1009 STORE FIRST DIGITAL DATA IN DATABASE

↓

1011 DIGITALLY CAPTURE CORRESPONDING SECOND SHAPE

↓

1013 PRODUCE SECOND DIGITAL DATA

↓

1015 STORE SAID SECOND DIGITAL DATA IN SAID DATABASE

↓

1017 PROVIDE ONE TO ONE CORRESPONDENCE BETWEEN EACH FIRST DIGITAL DATA AND CORRESPONDING SECOND DIGITAL DATA

FIG. 10

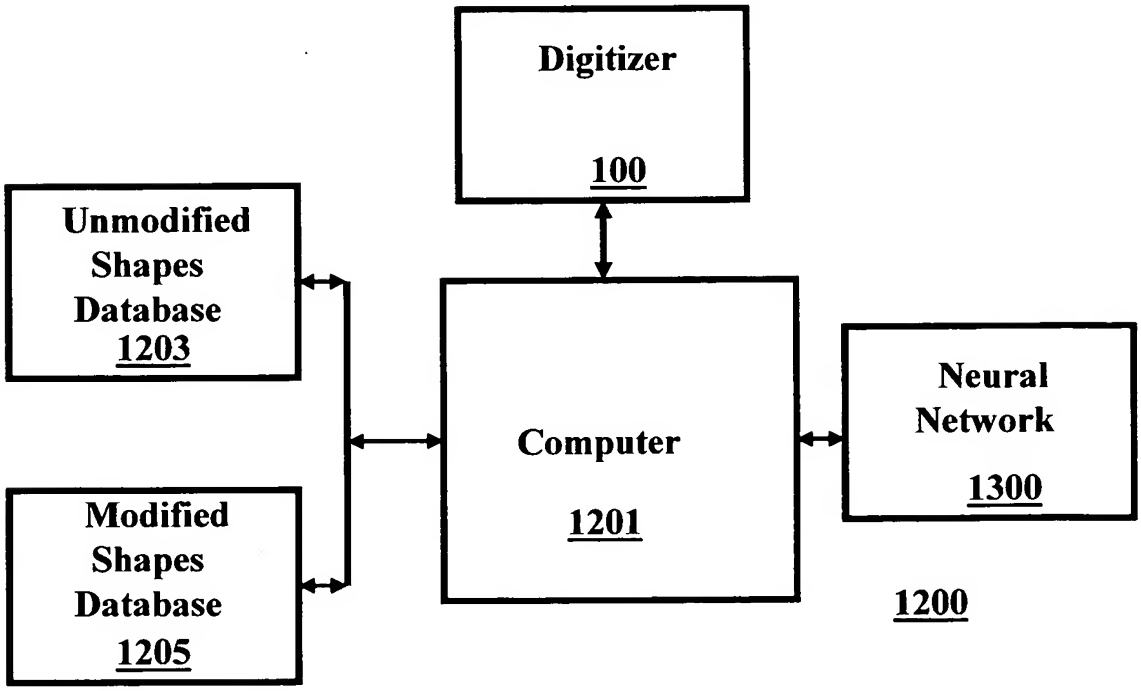

FIG. 11

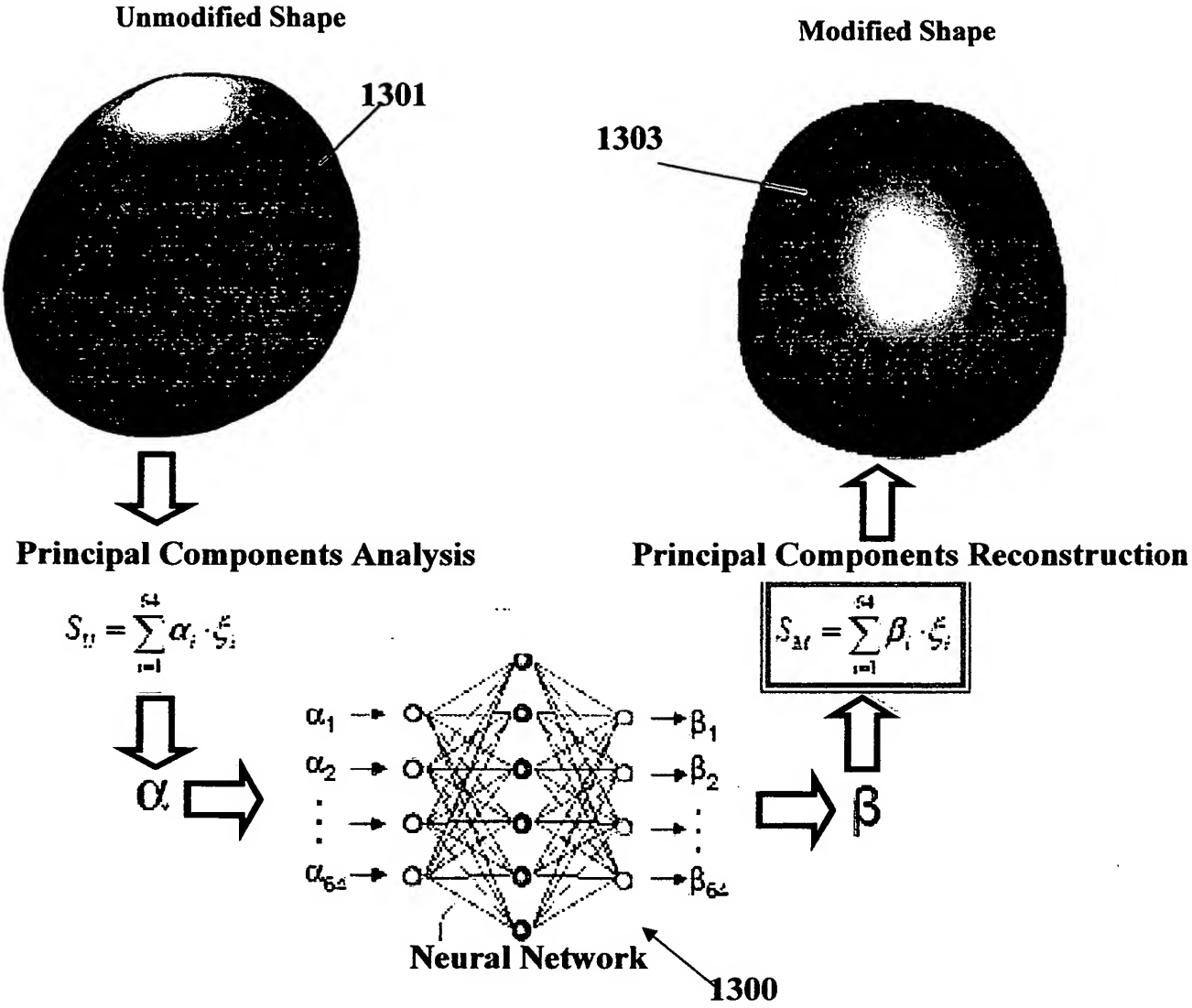

FIG. 12

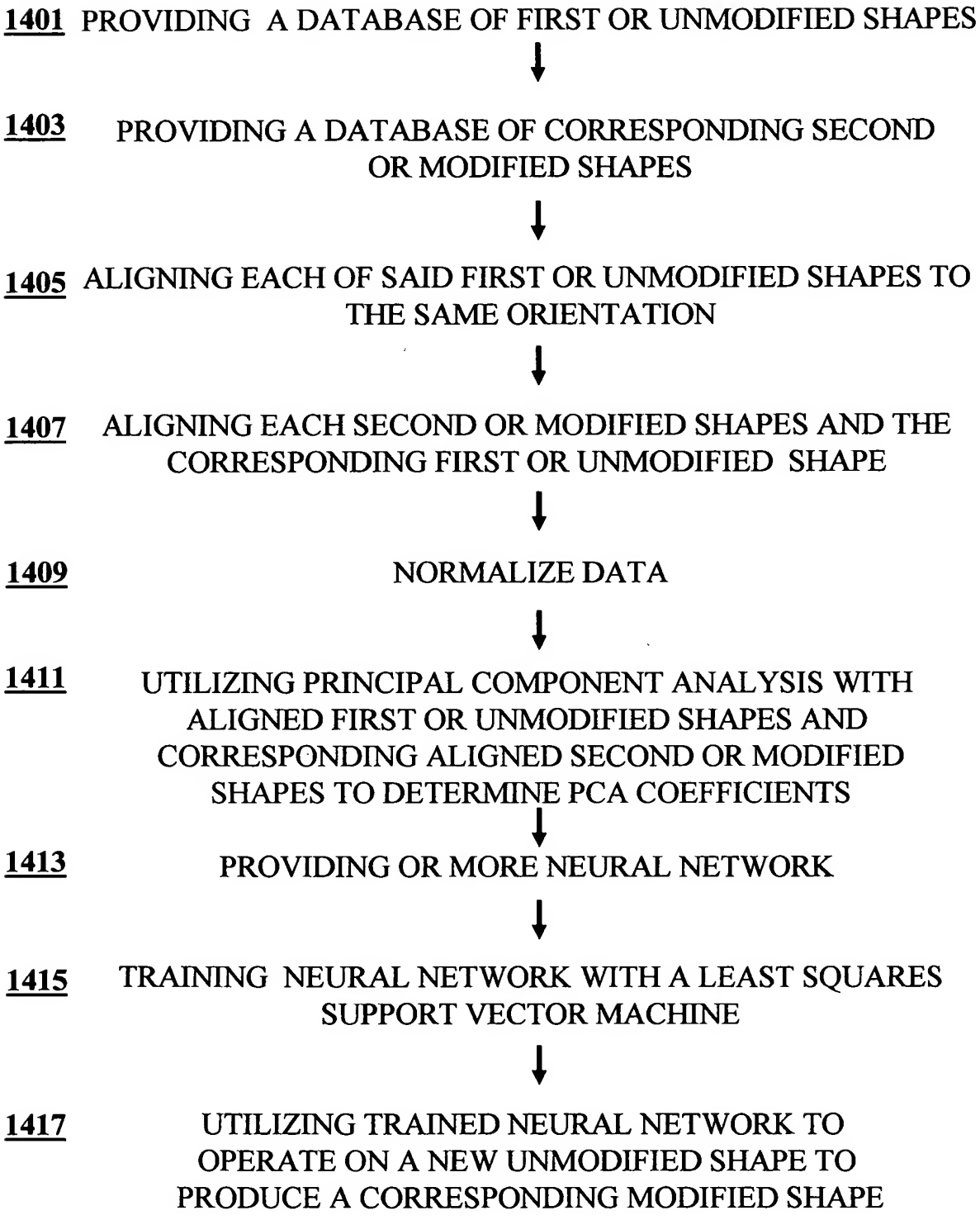
1401 PROVIDING A DATABASE OF FIRST OR UNMODIFIED SHAPES
1403 PROVIDING A DATABASE OF CORRESPONDING SECOND OR MODIFIED SHAPES
1405 ALIGNING EACH OF SAID FIRST OR UNMODIFIED SHAPES TO THE SAME ORIENTATION
1407 ALIGNING EACH SECOND OR MODIFIED SHAPES AND THE CORRESPONDING FIRST OR UNMODIFIED SHAPE
1409 NORMALIZE DATA
1411 UTILIZING PRINCIPAL COMPONENT ANALYSIS WITH ALIGNED FIRST OR UNMODIFIED SHAPES AND CORRESPONDING ALIGNED SECOND OR MODIFIED SHAPES TO DETERMINE PCA COEFFICIENTS
1413 PROVIDING OR MORE NEURAL NETWORK
1415 TRAINING NEURAL NETWORK WITH A LEAST SQUARES SUPPORT VECTOR MACHINE
1417 UTILIZING TRAINED NEURAL NETWORK TO OPERATE ON A NEW UNMODIFIED SHAPE TO PRODUCE A CORRESPONDING MODIFIED SHAPE

FIG. 13

Hyperparameter		
PCA Coefficient	Gamma	Sigma
1	20	33
2	32	77
3	17	107
4	68	86
5	47	47
6	32	122
7	62	62
8	92	92
9	56	134
10	77	77
11	62	50
12	92	92
13	62	92
14	77	152
15	77	77
16	107	62
17	77	62
18	137	32
19	77	62
20	68	47
21	92	62
22	107	77
23	173	83
24	122	62
25	122	122
26	62	107
27	62	92
28	122	68
29	182	116
30	182	128
31	92	38
32	182	92
33	182	92
34	152	152
35	182	92
36	182	122
37	128	122
38	152	152
39 – 64	160	125

FIG. 14

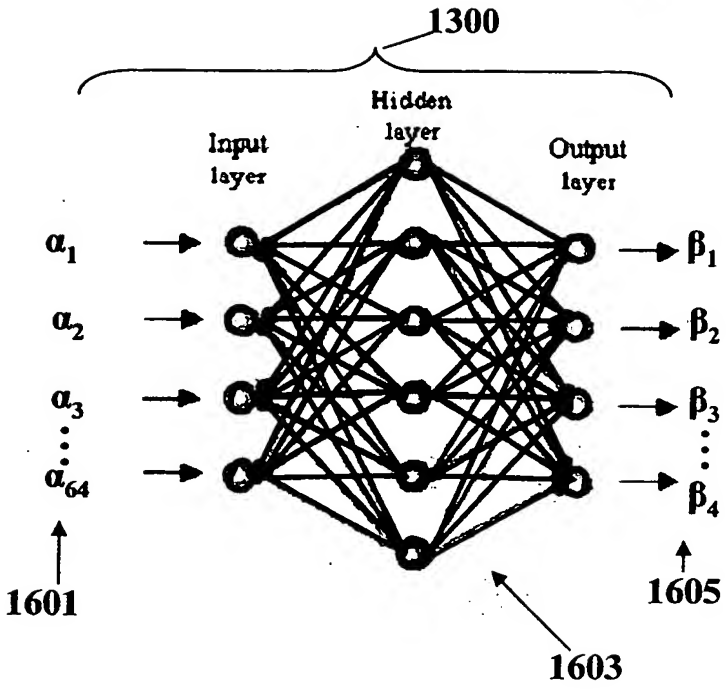

FIG. 15

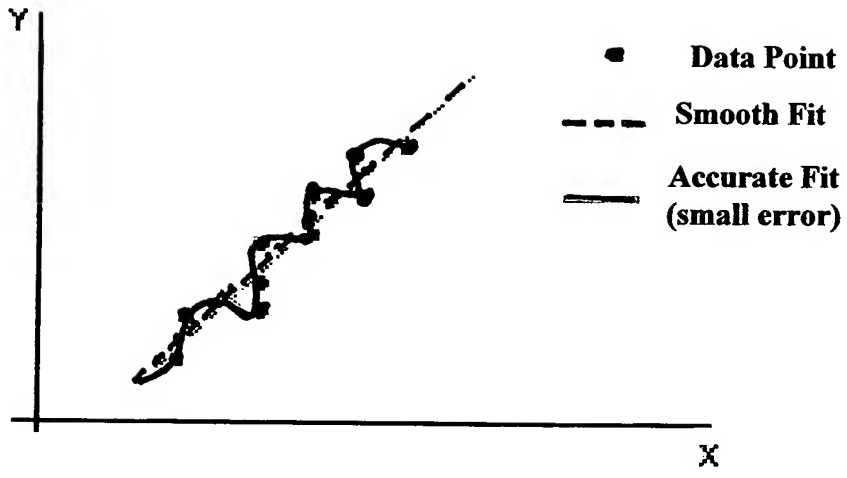

FIG. 16

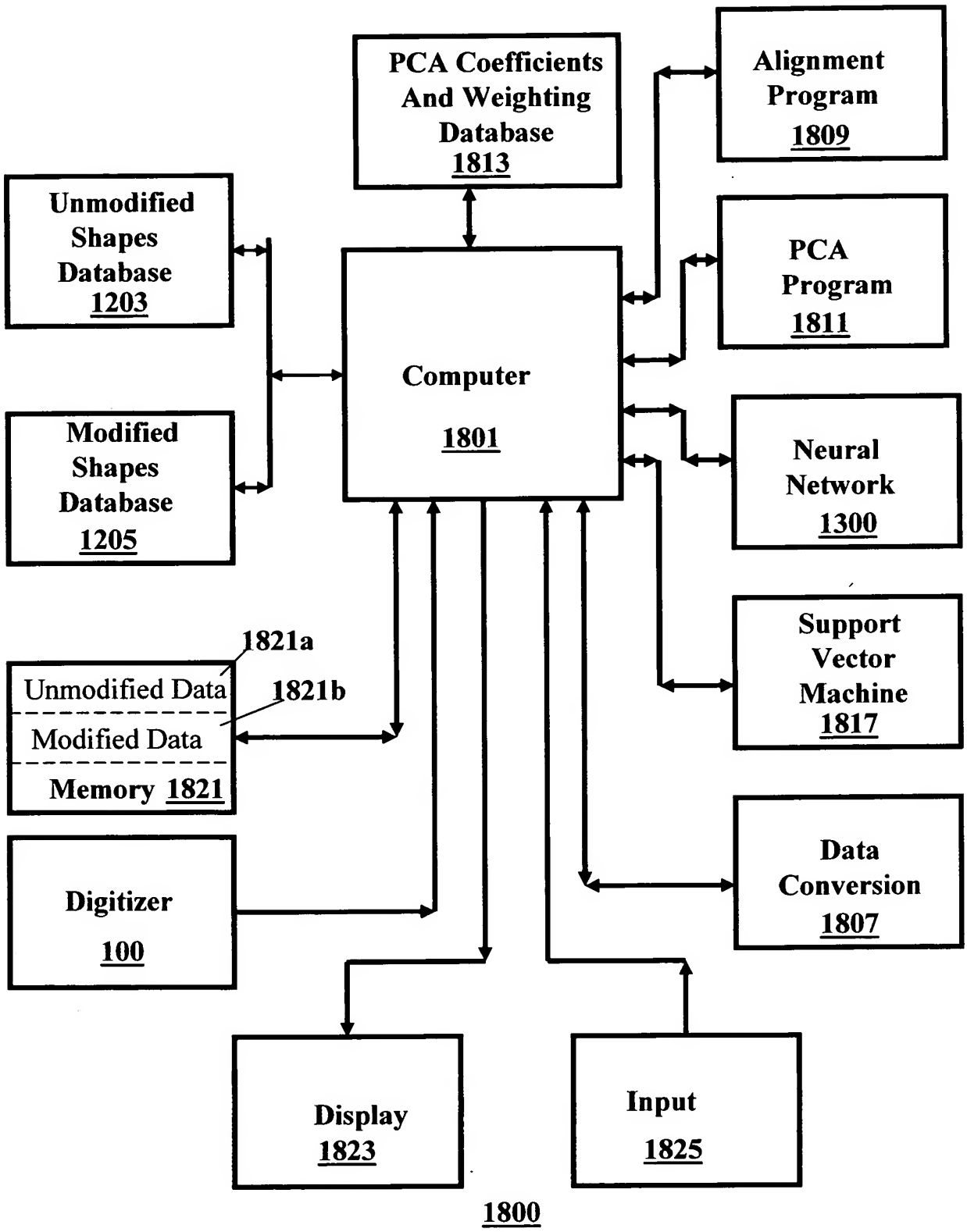
PCA Coefficients And Weighting Database 1813
Alignment Program 1809
Unmodified Shapes Database 1203
PCA Program 1811
Computer 1801
Modified Shapes Database 1205
Neural Network 1300
1821a
Unmodified Data
1821b
Modified Data
Memory 1821
Support Vector Machine 1817
Digitizer 100
Data Conversion 1807
Display 1823
Input 1825
1800

FIG. 17

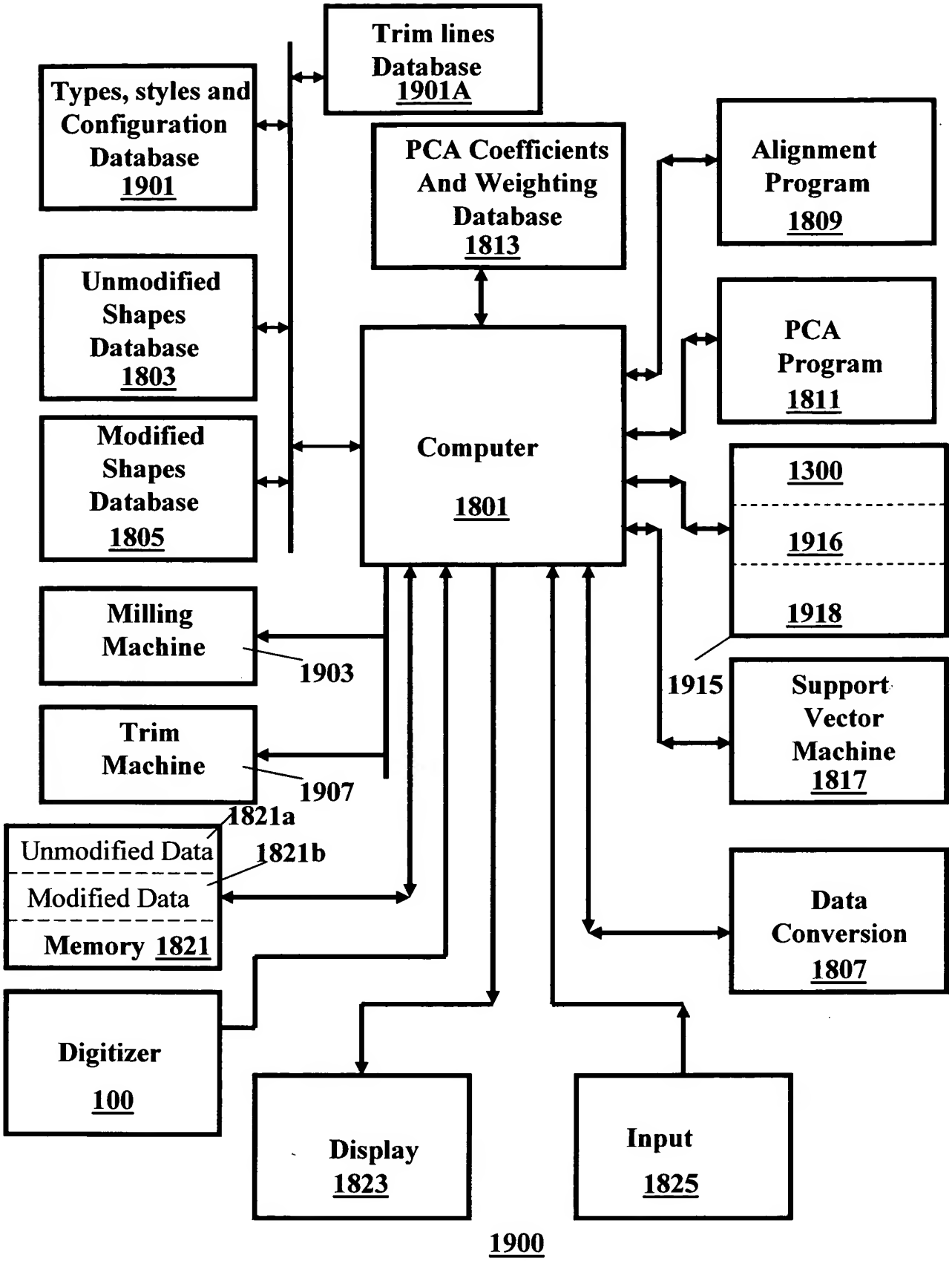
Trim lines Database 1901A
Types, styles and Configuration Database 1901
PCA Coefficients And Weighting Database 1813
Alignment Program 1809
Unmodified Shapes Database 1803
PCA Program 1811
Modified Shapes Database 1805
Computer 1801
1300
1916
1918
Milling Machine
1903
1915
Support Vector Machine 1817
Trim Machine
1907
1821a
1821b
Unmodified Data
Modified Data
Memory 1821
Data Conversion 1807
Digitizer 100
Display 1823
Input 1825
1900

FIG. 18

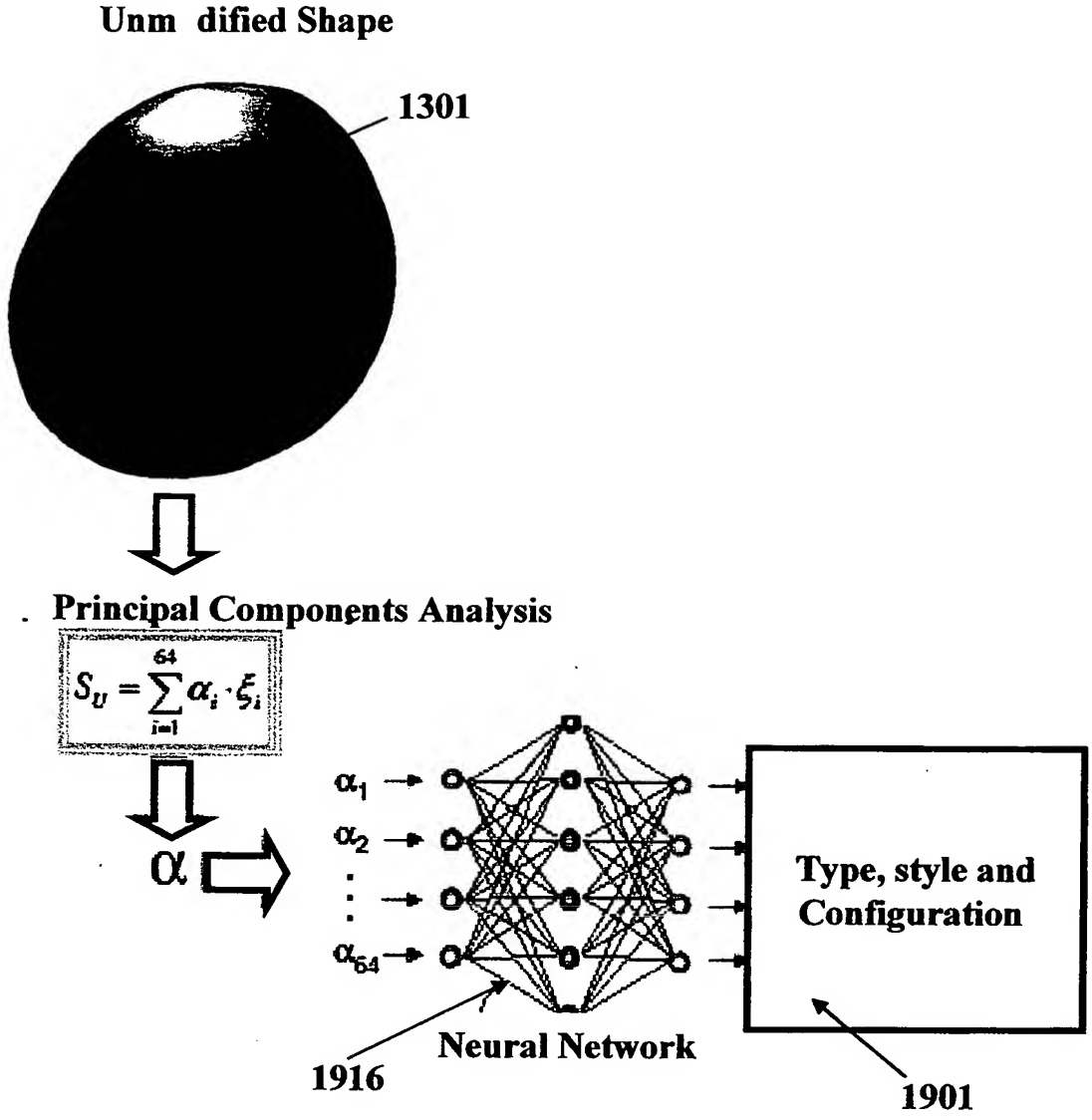

FIG. 19

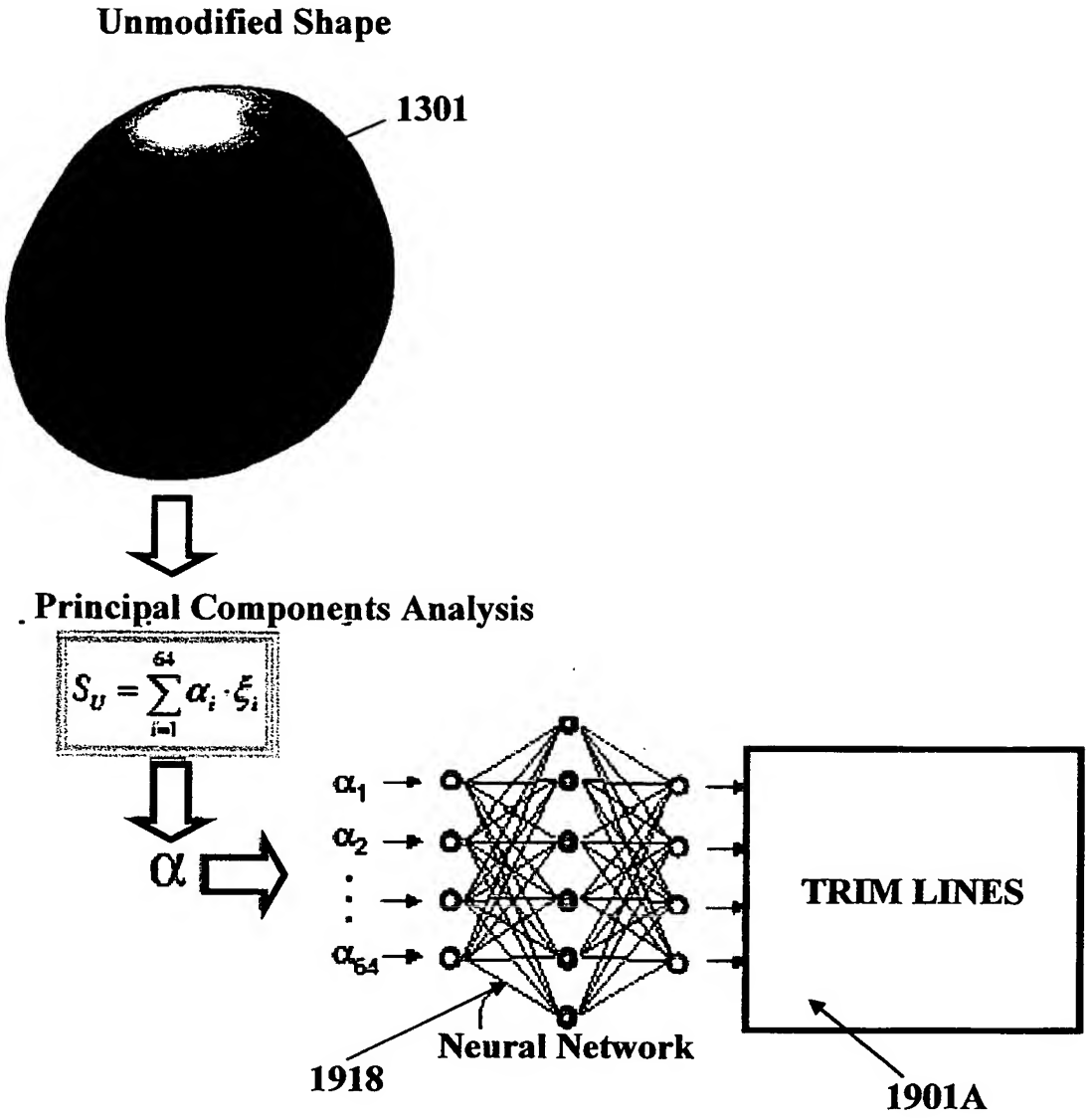

FIG. 20

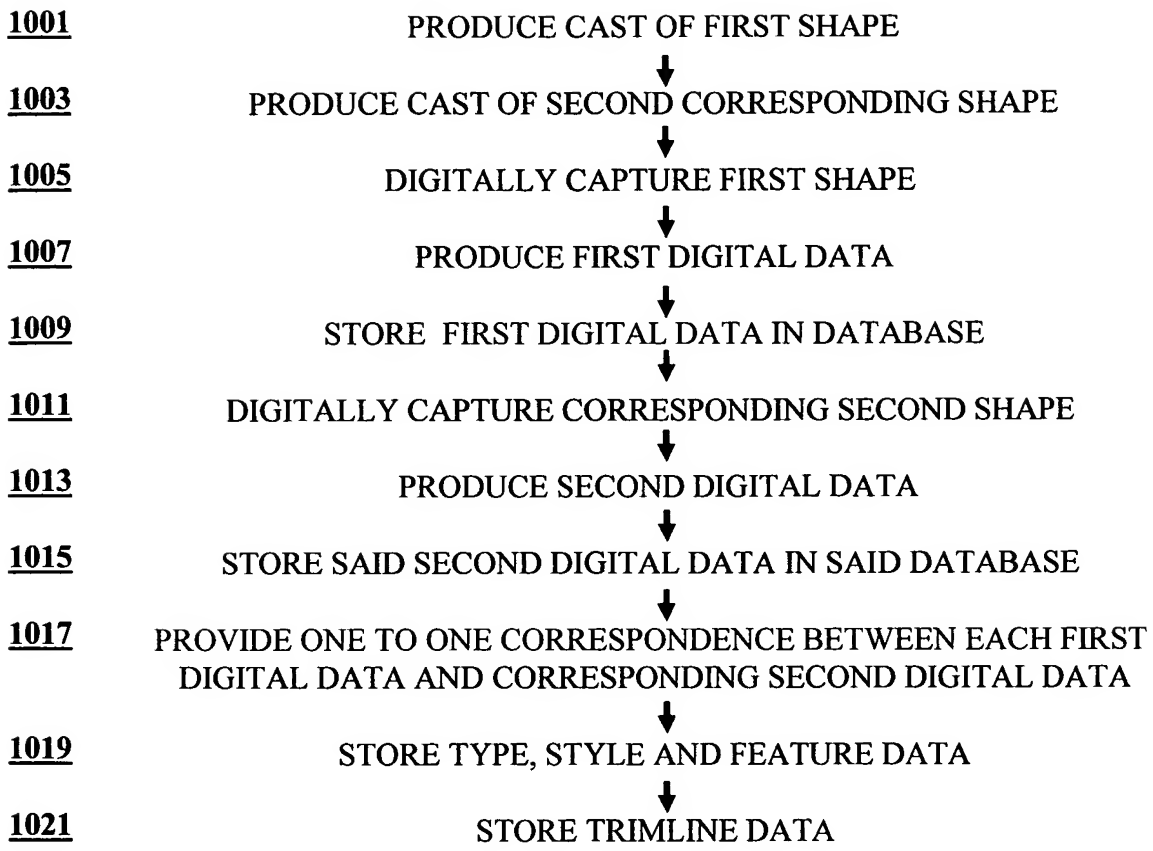
1001
PRODUCE CAST OF FIRST SHAPE
1003
PRODUCE CAST OF SECOND CORRESPONDING SHAPE
1005
DIGITALLY CAPTURE FIRST SHAPE
1007
PRODUCE FIRST DIGITAL DATA
1009
STORE FIRST DIGITAL DATA IN DATABASE
1011
DIGITALLY CAPTURE CORRESPONDING SECOND SHAPE
1013
PRODUCE SECOND DIGITAL DATA
1015
STORE SAID SECOND DIGITAL DATA IN SAID DATABASE
1017
PROVIDE ONE TO ONE CORRESPONDENCE BETWEEN EACH FIRST DIGITAL DATA AND CORRESPONDING SECOND DIGITAL DATA
1019
STORE TYPE, STYLE AND FEATURE DATA
1021
STORE TRIMLINE DATA

FIG. 21

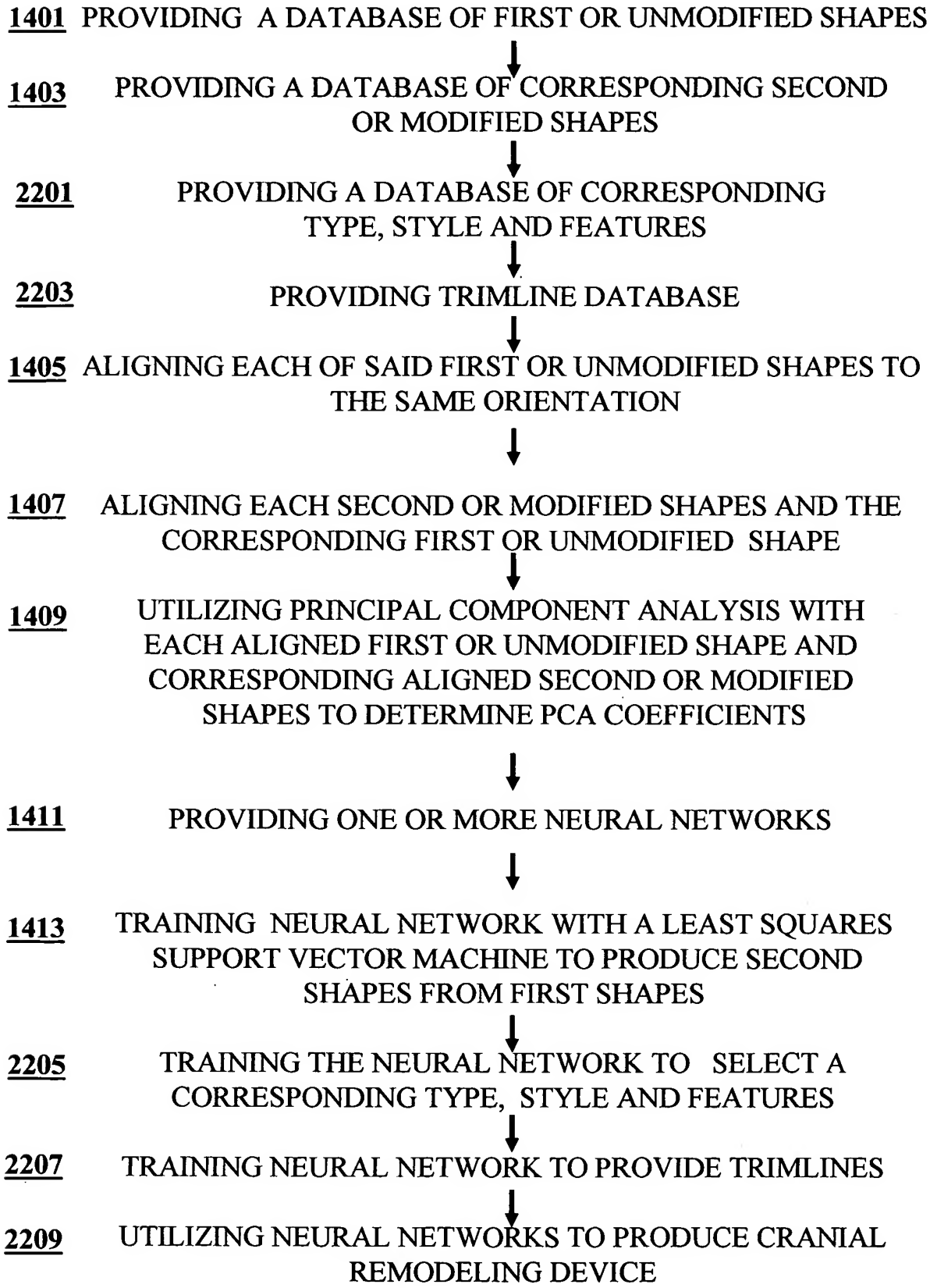
1401 PROVIDING A DATABASE OF FIRST OR UNMODIFIED SHAPES
1403 PROVIDING A DATABASE OF CORRESPONDING SECOND OR MODIFIED SHAPES
2201 PROVIDING A DATABASE OF CORRESPONDING TYPE, STYLE AND FEATURES
2203 PROVIDING TRIMLINE DATABASE
1405 ALIGNING EACH OF SAID FIRST OR UNMODIFIED SHAPES TO THE SAME ORIENTATION
1407 ALIGNING EACH SECOND OR MODIFIED SHAPES AND THE CORRESPONDING FIRST OR UNMODIFIED SHAPE
1409 UTILIZING PRINCIPAL COMPONENT ANALYSIS WITH EACH ALIGNED FIRST OR UNMODIFIED SHAPE AND CORRESPONDING ALIGNED SECOND OR MODIFIED SHAPES TO DETERMINE PCA COEFFICIENTS
1411 PROVIDING ONE OR MORE NEURAL NETWORKS
1413 TRAINING NEURAL NETWORK WITH A LEAST SQUARES SUPPORT VECTOR MACHINE TO PRODUCE SECOND SHAPES FROM FIRST SHAPES
2205 TRAINING THE NEURAL NETWORK TO SELECT A CORRESPONDING TYPE, STYLE AND FEATURES
2207 TRAINING NEURAL NETWORK TO PROVIDE TRIMLINES
2209 UTILIZING NEURAL NETWORKS TO PRODUCE CRANIAL REMODELING DEVICE

FIG. 22

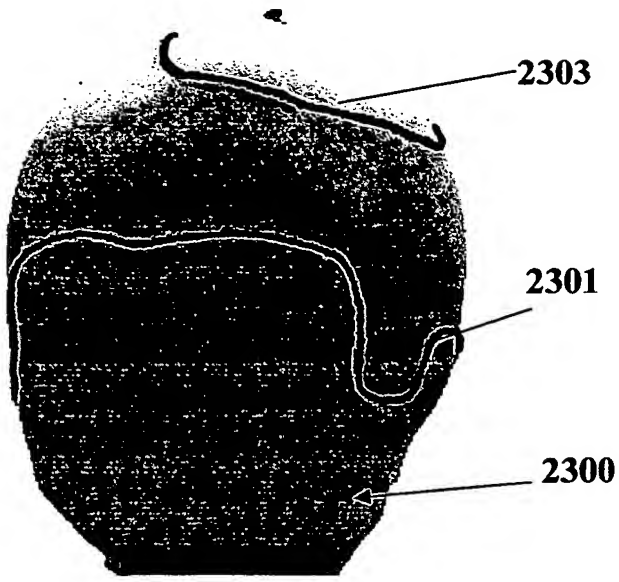

FIG. 23

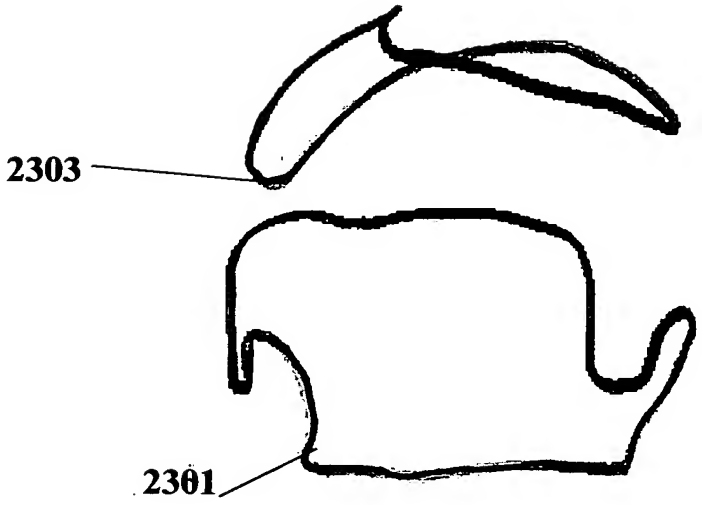

FIG. 24

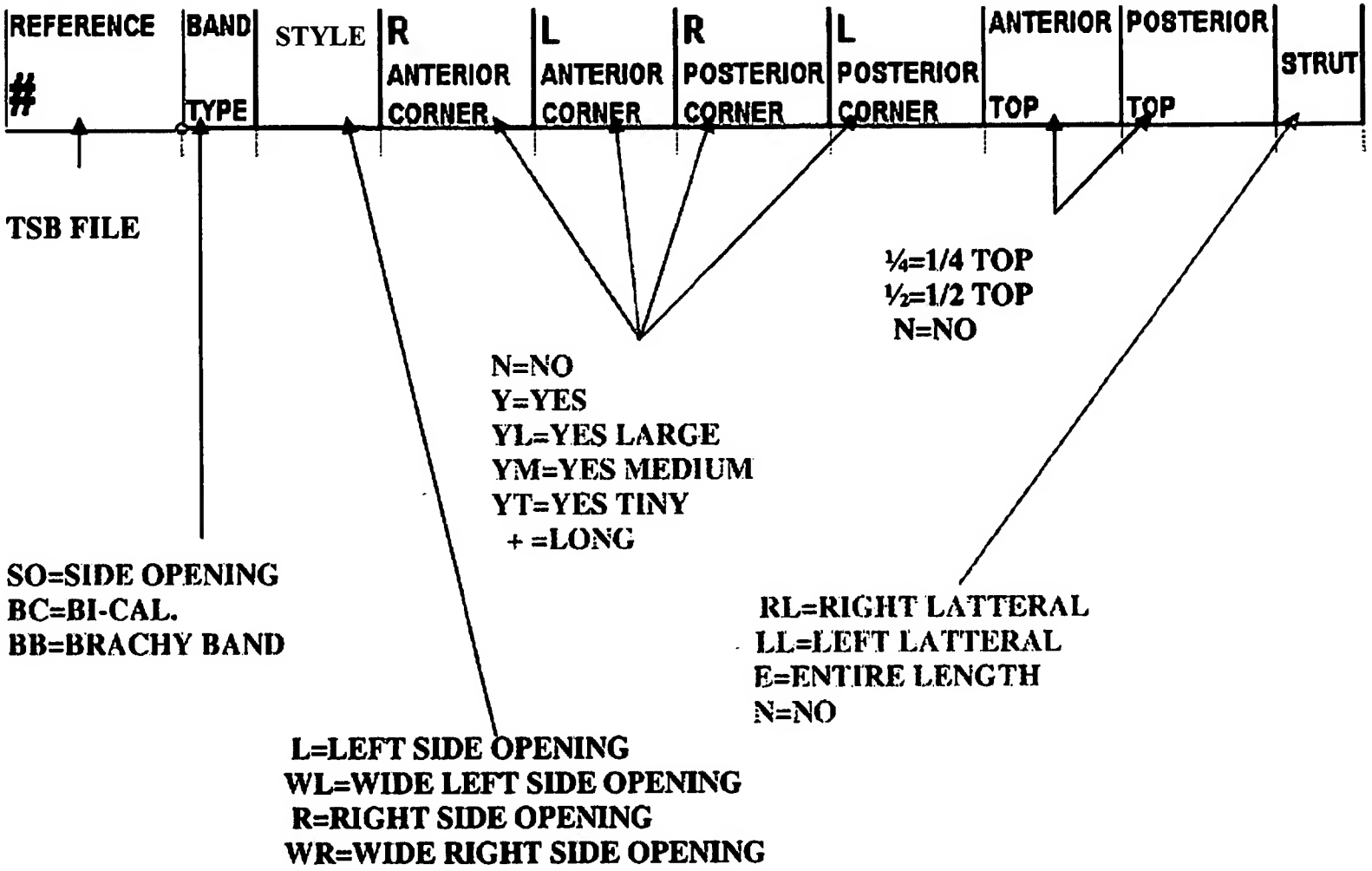
REFERENCE #
BAND TYPE
STYLE
R ANTERIOR CORNER
L ANTERIOR CORNER
R POSTERIOR CORNER
L POSTERIOR CORNER
ANTERIOR TOP
POSTERIOR TOP
STRUT
TSB FILE
¼=1/4 TOP
½=1/2 TOP
N=NO
N=NO
Y=YES
YL=YES LARGE
YM=YES MEDIUM
YT=YES TINY
+ =LONG
SO=SIDE OPENING
BC=BI-CAL.
BB=BRACHY BAND
RL=RIGHT LATTERAL
LL=LEFT LATTERAL
E=ENTIRE LENGTH
N=NO
L=LEFT SIDE OPENING
WL=WIDE LEFT SIDE OPENING
R=RIGHT SIDE OPENING
WR=WIDE RIGHT SIDE OPENING

FIG. 25